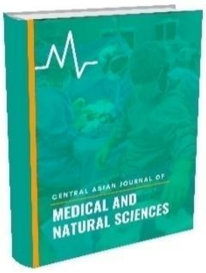
CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES



Volume: 03 Issue: 03 | May- Jun 2022 ISSN: 2660-4159

http://cajmns.centralasianstudies.org

Factors Predicting Mortality in Pulmonary Tuberculosis

1. **Abukarimov Mirzobek Ulugbek o'gli**

Received 18th Apr 2022,
Accepted 26th May 2022,
Online 7th Jun 2022

[1] Bukhara State Medical Institute

Annotation: According to official statistics, destructive pulmonary tuberculosis was diagnosed in 13.4% of newly diagnosed patients.Children and 37.3% of adolescents. Proportion of bacteria excretors was 4.6% among children and 26.9% among adolescents. This study aimed to analyse the predictors of mortality in hospitalized pulmonary TB patients with acute respiratory failure. This prospective cohort study was implemented in a tertiary hospital in Bukhara. Demographic data, acid-fast bacilli (AFB) sputum smear, radiographic conclusion, biochemical analysis of blood,and clinical outcomes from active pulmonary TB patients who had acute respiratory failure were collected. A chisquare test was run to analyse the relationship between variables.

Keywords: tuberculosis, radiographic conclusion, luminescent microscopy, diagnosis.

Introduction. According to official statistics, destructive pulmonary tuberculosis was diagnosed in 13.4% of newly diagnosed patients. Children and 37.3% of adolescents. Proportion of bacteria excretors was 4.6% among children and 26.9% among adolescents. Detection of Mycobacterium tuberculosis in sputum

of patients with tuberculosis of the respiratory organs is carried out by microbiological methods and takes a certain time: fluorescence microscopy - response after 24 hours, detection of MBT DNA by PCR - 24 hours, culture

using liquid media BACTECMGIT 960 from 2 to 4 weeks Tuberculosis (TB) remains a global health problem with high morbidity and mortality rate. The high mortality rate of this disease was caused by many factors and complications such as hemoptysis, septic shock, and respiratory failure. Further methods have been combined with culture to successfully diagnose TB including, the chest X-ray and the Tuberculin skin test . Nevertheless, their efficacy was found to be relatively poor when compared with other more modern methods, which utilise molecular or immunological techniques. The diagnostic flaws of these methods are often attributed to the effect of the human error in interpretation of the results. To overcome this, several companies are developing computational algorithms and the use of Artificial Intelligence (AI) to better interpret chest X-ray results (discussed later) .Historically, the above described direct detection methods have formed the basis of TB diagnostics. However recently, a shift has occurred towards, either molecular or immunological methods. Several studies reported the mortality rate in pulmonary TB patient who went through acute respiratory failure were as

high as 65.6–74.0%.The availability of the intensive-care unit (ICU) for TB patients is one important factor that can contribute to lower mortality rate, especially for pulmonary TB cases with acute respiratory failure, multiorgan failure, decreased consciousness, etc. In some developing countries, the availability of respiratory intensive-care unit (RICU) needed in treating pulmonary TB patients who need mechanical ventilation support was limited. The inadequate number of RICU will eventually increase the mortality rate of the patients. Understanding the independent factors related to mortality in pulmonary TB patients who had acute respiratory failure will improve management and treatment. Some studies in several countries showed that old age, positive acid-fast bacilli (AFB) smear of sputum, severity of chest radiograph, presence of pneumonia, Diabetes Mellitus (DM), low albumin level, sepsis, and multiorgan failure were the mortality predictor factors in pulmonary TB with acute respiratory failure. This study aimed to analyse factors that predict mortality in active pulmonary TB patients with respiratory failure.

Materials and methods

Population and design study: Data were collected with consent from active pulmonary TB patients (≥18 years old) with acute respiratory failure, who were hospitalized in the pulmonary ward (not in the ICU nor treated with mechanical ventilator). Diagnosis of active pulmonary tuberculosis was based on respiratory symptoms, chest x-ray, and AFB sputum. Respiratory failure refers to blood gas analysis with PaO2≤ 60 mmHg and/or PaCO2 >45 mmHg without supplementary oxygen or PaO2/FiO2 ratio <300 mmHg with supplementary oxygen.Patients who were diagnosed with pulmonary malignancies, chronic kidney disease, human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), acute heart failure, and chronic liver disease were excluded. The independent variables were age, AFB sputum smear results, thorax radiographic findings, concomitant pneumonia, sepsis, hypoalbuminemia, and DM. The dependent variable was mortality rate. Follow-up was carried out until two weeks after participating patients were discharged from the hospital. Demographic data and patients' characteristics were descriptively presented in frequency and percentage for categorical data. Average standard intersection was used for continuous data. Mortality predictor factors were analyzed using Chi-square continue with multivariate logistic regression to obtain the mortality predictor factor model. The result was presented in Odds Ratio (OR) with a significant p-value of <0.05 and a confidence interval (CI) of 95%.

Results. During the 3 months observation period, 233 tuberculosis patients were hospitalized in the pulmonary ward, of which 35 had acute respiratory failure. Of the 34 patients, 28 (76.1%) were male and 8 (21.9%) were female. Mean age was 52 years old. Mean hospitalization duration was 10.0 ± 5.83 days, 16 (45.7%) patients had DM as a comorbid disease. 23 (65.7%) patients had concomitant pneumonia which was categorized as community-acquired pneumonia (CAP). From physical examination, Body Mass Index (BMI) median was 20.76 kg/m2. Based on the laboratory result, mean albumin level was 3.07 ± 0.56 g/dL. Median of procalcitonin level was 0.73 ng/mL.19 (54.3%) patients had a PaO2/FiO2 ratio range between 200–300 mmHg. Microbiology examination showed 25 (71.4%) patients had positive AFB smear of sputum and 10 (28.6%) patients had negative results. Radiology examination demonstrated fibro infiltrate with consolidation (65.7%) and cavity lesion (65.7%) as the common findings in the study subjects. The median chest X-Ray score in this study was 6, while the majority of the patients (60%) had a lower median total score (≤6). The median of the Sequential Organ Failure Assessment (SOFA) score was 3. The demographic data, radiology, microbiology, and laboratory results are presented in.

Among 35 patients with active pulmonary TB and acute respiratory failure, a total of 15 (42.9%) patients died and 20 (57.1%) patients survived. Mortality predictor factor analysis was done in two steps. The first step was bivariate analysis. Because the data is categorical, Chi-square test was used. Then predictor factors with p-value <0.25 were evaluated using multivariate logistic regression

analysis. Variables with pvalue <0.05 is statistically significant. Odds ratio (OR) and their 95% CIs indicated factors that predicted mortality. Showed the result of Chi-square test. Variables of the nonsurvivor group were positive AFB smear result, pneumonia classification, hypoalbuminemia (albumin level <3 g/dL), SOFA score, and presence of DM. Result of multivariate logistic regression analysis showed that hypoalbuminemia (OR, 12.254; 95% CI,1.924–78.062) and DM (OR, of 8.448; 95% CI,1.350–52.872) were significantly related to mortality. In Bukhara showed that in hypoalbuminemia, the survival tends to decrease between 5–15 days with 0% survival rate. A higher mortality rate was seen in hypoalbuminemia than non-hypoalbuminemia patients (p = 0.001, log-rank test). A similar outcome was seen in the analysis of the presence of DM, the survival decreased between 5–15 days with 30% survival rate. A higher mortality rate was seen in patients with DM than non-DM patients (p = 0.015, logrank test.

Literature review

1. Isomiddin USMONOV, Umrzok SHUKUROV. (2021). Features of the Clinical Course, the State of Diagnosis and Treatment of Hiv-Associated Pulmonary Tuberculosis in Modern Conditions Literature Review. Annals of the Romanian Society for Cell Biology, 1809–1828.
2. Isomiddin Xaydarovich Usmonov, Nodir Yusufovich Kobilov. (2021). Epidemiology, Clinical Course, Diagnosis and Treatment of Generalized Tuberculosis in Modern Circumstances Literature Review. Annals of the Romanian Society for Cell Biology, 25(2), 3806–3819.
3. Kh U. I., Muazzamov B. R., Jumaev M. F. Features of diagnostics and treatment of drug-resistant forms of pulmonary tuberculosis //International journal of pharmaceutical research. – 2021. – T. 13. – №. 1. – С. 2484-2489.
4. Парпиева, Н. Н., Усмонов, И. Х., Кобилов, Н. Ю., & Жумаев, М. Ф. (2020). Особенности диагностики и лечении при генерализированных формах туберкулёза. Новый день в медицине. Бухара, (2), 424-428.
5. И. Х. Усмонов, У. З. Шукуров, М. У. Абдукаримов, Ж. О. Сулаймонов СОВРЕМЕННАЯ ДИАГНОСТИКА И ЛЕЧЕНИЯ ТУБЕРКУЛЕЗА ЛЕГКИХ У ВИЧ ИНФИЦИРОВАННЫХ БОЛЬНЫХ // Scientific progress. 2021. №5. URL: https://cyberleninka.ru/article/n/sovremennaya-diagnostika-i-lecheniya-tuberkuleza-legkih-u-vich-infitsirovannyh-bolnyh (дата обращения: 16.03.2022).
6. Муаззамов, Б. Р., & Жумаев, М. Ф. (2018). О преподавании фтизиатрии на лечебном и медико-педагогическом факультетах. Материалы VIII Съезда фтизиатров и пульмонологов Узбекистана. Тошкент, 109-110.
7. Aslonov F.I, Rustamova S.A., & Raxmonova K.M. (2021). IMMUNOPATOLOGICAL ASPECTS IN PATIENTS WITH FIRST DETECTED PULMONARY TUBERCULOSIS. World Bulletin of Public Health, 4, 91-95. Retrieved from https://scholarexpress.net/index.php/wbph/article/view/282
8. Ismoilovich, A. F. . (2022). Modern Diagnostic Test for Tuberculosis. European Multidisciplinary Journal of Modern Science, 4, 408–412. Retrieved from https://emjms.academicjournal.io/index.php/emjms/article/view/106
9. Bakhtiyor Z. Khamdamov, Farrux I. Aslonov, Salim, S. I. A. T. M. Z. R. R. (2021). CURRENT INTERNATIONAL STANDARDS FOR MONITORING LOWER URINARY TRACT SYMPTOMS AND SIGNS OF BENIGN PROSTATIC HYPERPLASIA AND TUBERCULOSIS PATIENTS . Journal of Natural Remedies, 22(1(2), 117-123. Retrieved from https://www.jnronline.com/ojs/index.php/about/article/view/908

10. Akhtamovna, K. N. (2021). Fibrotic Complications in the Lungs in Patients Who Have Had COVID-19 Pathogenesis of COVID-19. European Journal of Life Safety and Stability (2660-9630), 9, 14-24.
11. Жумаев Мухтор Фатуллаевич СЛОЖНОСТИ ДИАГНОСТИКИ И ЛЕЧЕНИЯ ЛЕКАРСТВЕННО-УСТОЙЧИВЫХ ФОРМ ТУБЕРКУЛЁЗА ЛЕГКИХ // Вопросы науки и образования. 2021. №15 (140). URL: https://cyberleninka.ru/article/n/slozhnosti-diagnostiki-i-lecheniya-lekarstvenno-ustoychivyh-form-tuberkulyoza-legkih (дата обращения: 16.03.2022).
12. Халилова Д. С. Пути улучшения диагностических и тактических возможностей в лечении внебольничных пневмоний в Бухарской области //Ўзбекистонда илмий-амалий тадқиқотлар. – 2021. – Т. 2. – №. 28. – С. 18.
13. С.А. Рустамова, К.С. Мухамедов, М.Х. Джурабаева, М.И. Ходжаева Спектр лекарственной устойчивости и эффективность лечения впервые выявленных больных туберкулезом легких // Медицинский альянс "Национальная Ассоциация Фтизиатров". 2015. № 1. С. 116-116.
14. Salimovna, A. G. . (2022). Diagnosis of Tuberculosis Infection Activity by ELISA and Transcription Analysis Methods. European Multidisciplinary Journal of Modern Science, 4, 492–497. Retrieved from https://emjms.academicjournal.io/index.php/emjms/article/view/120
15. o'gli, A.M.U. 2022. Test for Procalcitonin as a Way to Predict Patients with Respiratory Tuberculosis. European Multidisciplinary Journal of Modern Science. 4, (Mar. 2022), 486–491.
16. Мизробовна, Р.К. 2021. Туберкулез Легких И Сопутствующие Заболевания. CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES. 2, 6 (Nov. 2021), 137-144. DOI:https://doi.org/10.47494/cajmns.v2i6.496.
17. Mizrobovna, R. K. . (2022). Accompanying Diseases of the Respiratory System Pulmonary Tuberculosis. European Multidisciplinary Journal of Modern Science, 4, 244–250. Retrieved from https://emjms.academicjournal.io/index.php/emjms/article/view/75
18. Guljamol Fazliddinonvna Makhmudova, Adkhambek Uygunovich Nurboboyev.Treatment of mechanical jaundice via the modern way// Scientific progress, 2021.-№6.-P.530-537
19. Makhmudova G.F. Age-related clinical, anatomical and morphological features of malignant tumors of the cervix// Journal of science and technology//2021.-P.-475-480
20. М.А. Ахмадова, А.Т.,Сохибова З.Р., Д.К. Худойбердиев.,Ж.Р.Нуров Диагностика эхинококкоза у молодёжи на современнιом этапе./Тиббиётда янги кун 2019 й.3(27)- стр 54-56
21. М.А. Ахмадова, А.Т. Чўлиев, Ж.Р. Нуров, Д.К. Худойбердиев Лучеваядиагностикаэхинококкозапечени./Биологияватиббиётмуаммолари.2019,№4.2(115)с. 20-25
22. Сохибова З.Р.,Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени./Oriental Renaissance: Innovative, Educational, natural and social sciences/2021й -стр 203-212.
23. Сохибова З.Р.,Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени./Oriental Renaissance: Innovative, Educational, natural and socialsciences/2021й -стр 203-212.
24. НарзиеваД.Ф.ЗначениеИммуногистохимических маркеров при метастазировании рака молочной железы в легкие.// Oriental Renaissance: Innovtive, educational, natural and social sciences.// -2021 Vol.1-C.170-175

25. Xalikova Feruza. Current concepts of breast cancer risk factors//International journal of philosophical studies and social sciences//2021.- Vol 1.-P.57-66.
26. Z.R. Sokhibova, M.R. Turdiyev, (**2021**). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research*, ***3(02)***, MO-**145**.
27. Mamedov U.S., Pulatova D.SH. The Results of Cancer Treatment of the Oral Caviti Tumors in //the Republic of Uzbekistan European journal of Pharmaceutical and Medical Research. -2019. - 6(9). - P. 326-329.
28. Narziyeva D.F., Jonibekov J.J.; Morphological features of tumor in different treatment options for patients with locally advanced breast cancer // Middle European scientific bulletin. Volume 7-2020-Dec. – P. 105-10
29. Nurov Jamshid Raxmatovich. Morphofunctional characters of the greater omentum // International Journal of Discoveries and Innovations in Applied Sciences. – 2021. – Vol. 1(5). – P. 130-134.
30. Nurov J.R., Khalikova F.S. Long-term results of surgical treatment patients with stomach cancer // Вестник науки и образования. – 2020. – №23-2(101). – С. 85-89.
31. R. R. Navruzov. Morphological and morphometric changes of the stomach layer of one monthly white rats // Journal For Innovative Development in Pharmaceutical and Technical Science (JIDPTS). Volume:4, Issue:5, May:2021 pp :(7-10)
32. R. R. Navruzov. Lymphothorp therapy in the complex of treatment of purulent inflammatory diseases of the hand in outpatient conditions // New day in medicine 30.2020
33. Гафур Нормуродович Саидов, Учкун Гафурович Абдукаримов, Гулжамол Фазлиддиновна Махмудова. Эпидемиологические показатели первично-множественных опухолей (обзор литературы)// Биология и интегративная медицина// 2019№ 11 (39).-С.
34. Нуров Ж.Р. Послеоперационная аналитика раннего периода хирургического лечения злокачественной опухоли желудка // Oriental Renaissance: Innovative, educational, natural and social sciences. – 2021. – Vol. 1(8). – P. 185-191.
35. Rakhmonovna, S. Z., & Sharipovna, A. N. (2020). Characteristics of exchange of essential microelements of copper and zinc in healthy fertilized women and women with combined copper and zinc deficiency state. *European Journal of Molecular & Clinical Medicine*, *7*(1), 3332-3335.
36. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. The Significance of Immunohistochemical Markers in the Treatment of Breast Cancer // International journal on orange technology. – 2021. – Vol. 03(9). – P. 69-72.
37. Nurov Jamshid Raxmatovich, Ahmadova Maftuna Amin qizi. Features of Anatomy of the Greater Omentum // International journal on orange technology. – 2021. – Vol. 03(9). – P. 66-68.
38. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. Immediate Results of Surgical Treatment of Gastric Cancer // International journal on orange technology. – 2021. – Vol. 03(9). – P. 62-65.
39. Sokhibova, Z. R., & Turdiyev, M. R. (2021). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research*, *3*(02), 140-145.

40. G.F.Makhmudova Colposcopic analysis of cervical pathology in women with uterine fibroids//Scientific progress// 3(1), 289-296,2022

41. А.У. Нурбобоев, МС Шаропова, А.Ф. Махмудова Турли этиологияли механик сарикликни даволашда замонапвий минилапаратом усуллар// Scientific progress// 3(1), 713-721, 2022

42. MG Fazliddinovna, NA Uygunovich, ND Faxriddinovna The modern way of diagnosis of cervical pathology in women with uterine fibroids via the colposcopy//Web of scientist: international scientific research journal.-3(02), 1017-1027, 2022.

43. Abdullayev Habibulla Narzulloyevich, Makhmudova Guljamol Fazliddinovna, Makhmudova Anora Fazliddinovna // Age-related clinical and instrumental analysis of malignant tumors of the cervix// Eurasian Medical Research Periodical.-2021 Vol 3, 1-8.

44. AH Narzulloyevich, MG Fazliddinovna, KF Sharopovna// Comparison of the results of modern methods of treatment of elderly women with breast cancer// Eurasian Medical Research Periodical 3, 9-15.

45. Muazzamov B.R.,Rustamova S.A.,Raxmonova K.M.Иммунологические особенности туберкулеза легких у впервые выявленных болных// Tibbiyotda yangi kun//4(36)2021